GSHWG ARAC Fast Track Report - FAR 25.963 (e) Fuel Tank Access Covers

1. What is the underlying safety issue addressed by the FAR/JAR?

Fuel tank access covers have failed in service due to impact with high speed objects such as failed tire tread material and engine debris following engine failures. Failure of an access cover on a wing fuel tank may result in the loss of hazardous quantities of fuel which could subsequently ignite.
In addition, prolonged exposure to a fire could cause sufficient damage to some fuel tank access covers designs to allow fuel leakage and subsequent ignition.

2. What are the current FAR and JAR standards?

FAR 25.963(e), Amendment 25-69

"(e) Fuel tank access covers must comply with the following criteria in order to avoid loss of hazardous quantities of fuel:
(1) All covers located in an area where experience or analysis indicates a strike is likely, must be shown by analysis or tests to minimize penetration and deformation by tire fragments, low energy engine debris, or other likely debris.
(2) All covers must be fire resistant as defined in part 1 of this chapter."

AC 25.963-1, dated 7/29/92

1. PURPOSE

This advisory circular (AC) sets forth a means of compliance with the provisions of Part 25 of the Federal Aviation Regulations (FAR) dealing with the certification requirements for fuel tank access covers on turbine powered transport category airplanes. Guidance information is provided for showing compliance with the impact and fire resistance requirements of FAR 25.963(e).

2. RELATED FAR SECTIONS

The contents of this AC are considered by the FAA in determining compliance of the fuel tank access covers with FAR 25.963(e). Section 121.316 also requires each turbine-powered transport category airplane operated in air carrier or commercial service after October 30, 1991, to meet the standards of FAR 25.963(e).

3. BACKGROUND

Fuel tank access covers have failed in service due to impact with high speed objects such as failed tire tread material and engine debris following engine failures. Failure of an access cover on a wing fuel tank may result in the loss of hazardous quantities of fuel which could subsequently ignite.

4. IMPACT RESISTANCE

a. All fuel tank access covers must be designed to minimize penetration and deformation by tire fragments, low energy engine debris, or other likely debris, unless the covers are located in an area where service experience indicates a strike is not likely. The rule does not specify rigid standards for impact resistance because of the wide range of likely debris which could impact the covers. The applicant should, however, choose to "minimize penetration and deformation" by testing covers using debris of a type, size, trajectory, and velocity that represents conditions anticipated in actual service for the airplane model involved. There should be no hazardous quantity of fuel leakage after impact. The access covers, however, need not be more impact resistant than the contiguous tank structure.

b. In the absence of a more rational method, the following criteria should be used for evaluating access covers for impact resistance.

(1) Covers located within 30 degrees inboard and outboard of the tire plane of rotation, measured from center of tire rotation with oleo strut in the nominal position, should be evaluated. The evaluation should be based on the results of impact tests using tire tread segments equal to 1 percent of the tire mass traveling at airplane rotation speed (V_R), and distributed over an impact area equal to 1 1/2 percent of the total tread area.

(2) For turbine powered airplanes, covers located within 15 degrees forward of the front engine compressor or fan plane measured from center of rotation to 15 degrees aft of the rearmost engine turbine plane measured from center of rotation, should be evaluated for impact from small fragments (shrapnel) with energies referred to in AC 20-128, Design Considerations for Minimizing Hazards Caused by Uncontained Turbine Engine and Auxiliary Power Unit Rotor and Fan Blade Failure, issued 3/9/88. The covers need not be designed to withstand impact from high energy engine fragments such as engine rotor segments or propeller blade fragments.

5. FIRE RESISTANCE

a. All fuel tank access covers must be fire resistant. The definition of fire resistant, as given in Part 1 of the FAR, means the capacity to withstand the heat associated with fire at least as well as aluminum alloy in dimensions appropriate for the purpose for which they are used. For the purpose of

complying with this requirement, the access cover is assumed to be subjected to fire from outside the fuel tank. The fuel tank access covers need not be more fire resistant than the contiguous tank structure.

b. Access covers, not as fire resistant as contiguous tank structures, should be tested for five minutes using a burner producing a 2000°F. flame. The test burner and procedures for instrumentation and calibration should be as defined in AC 20-135, Powerplant Installation and Propulsion System Component Fire Protection Test Methods, Standards, and Criteria, issued 2/6/90. The test cover should be installed in a test fixture representative of the actual installation in the airplane. Credit may be allowed for fuel as a heat sink if covers will be protected by fuel during all likely conditions. The maximum amount of fuel that should be allowed during this test is the amount associated with reserve fuel. Also, the static fuel pressure head should be accounted for during the burn test. There should be no burn-through or fuel leakage at the end of the tests; although damage to the cover and seal is permissible.

JAR 25.963(g), Amendment 93-1 to Change 13

"(g) Fuel tank access covers must comply with the following criteria in order to avoid loss of hazardous quantities of fuel:
(1) All covers located in an area where experience or analysis indicates a strike is likely, must be shown by analysis or tests to minimise penetration and deformation by tyre fragments, low energy engine debris, or other likely debris.
(2) Reserved
(See ACJ 25.963(g))"

ACJ 25.963(g), Amendment 93-1 to Change 13

"Fuel Tanks: General (Acceptable Means of Compliance)
See JAR 25.963(g)
1. *Purpose.* This ACJ sets forth an acceptable means of showing compliance with the provisions of JAR-25 dealing with the certification requirements for fuel tank access covers. Guidance information is provided for showing compliance with the impact resistance requirements of 25.963(g).
2. *Background.* Fuel tank access covers have failed in service due to impact with high speed objects such as failed tyre tread material and engine debris following engine failures. Failure of an access cover on a wing fuel tank may result in the loss of hazardous quantities of fuel which could subsequently ignite.

3. *Impact Resistance*

a. All fuel tank access covers must be designed to minimise penetration and deformation by tyre fragments, low energy engine debris, or other likely debris, unless the covers are located in an area where service experience or analysis indicates a strike is not likely. The rule does not specify rigid standards for impact resistance because of the wide range of likely debris which could impact the covers. The applicant should however, choose to "minimise penetration and deformation" by testing covers using debris of a type, size, trajectory, and velocity that represents conditions anticipated in actual service for the aeroplane model involved. There should be no hazardous quantity of fuel leakage after impact. The access covers, however, need not be more impact resistant than the contiguous tank structure.
b. In the absence of a more rational method, the following criteria should be used for evaluating access covers for impact resistance.
i. Covers located within 15° inboard and outboard of the tyre plane of rotation, measured from the centre plane of tyre rotation with oleo strut in the nominal position, should be evaluated. The evaluation should be based on the results of impact tests using tyre tread segments having width and length equal to the full width of the tread, with thickness of the full tread plus casing. The velocities used in the assessment should be based on the highest speed that the aircraft is likely to use on the ground. Generally, this will be the higher of the aircraft
rotation speed (Vr) and the flapless landing speed.
ii. Covers located within 15° forward of the front compressor or fan plane measured from the centre of rotation to 15° aft of the rearmost turbine plane measured from the centre of rotation, should be evaluated for impact from small fragments (shrapnel). The covers need not be designed to withstand impact from high energy engine fragments such as rotor segments."

Note: FAR 121.316 requires each turbine-powered transport category airplane operated in air carrier or commercial service after October 30, 1991, to meet the standards of 25.963(e). This requirement however was considered to be beyond the scope of the tasking to the GSWHG, and has therefore not been discussed. JAR-26 currently does not contain an equivalent retro-active requirement.

3. What are the differences in the standards and what do these differences result in?

FAR 25.963(e)(1) and JAR 25.963(g)(1) are identical.

FAR 25.963(e)(2) requires fuel tank access covers to be fire resistant. There is no such requirement in JAR-25. This results in additional compliance demonstration for FAR 25 compared to JAR-25.

4. What, if any, are the differences in the means of compliance?

The guidance given on tire debris is different in AC 25.963-1 from ACJ 25.963(g), in terms of tire fragment spread angle, tire fragment size and tire fragment speed. When applying the guidelines of ACJ 25.963(g) the result is a much higher impact energy of the tire fragments compared to application of the guidelines of AC 25.963-1, although the tire fragment spread angle defined in ACJ 25.963(g) is smaller than the angle defined in AC 25.963-1.

AC 25.963-1 contains guidance on showing compliance with the fire resistance requirement of FAR 25.963(e)(2). Because JAR 25.963(g)(2) does not require fuel tank access covers to be fire resistant, ACJ 25.963(g) does not contain any guidance on this subject.

5. What is the proposed action?

The proposed action is, for the rule, to harmonize on a revised wording of FAR 25.963(e)(2) / JAR 25.963(g)(2). This proposal removes the words "fire resistant" from the rule, and replaces it by the definition of fire resistant of part 1, allowing that the fuel tank access covers need not be more resistant to fire than an access cover made from the base fuel tank structural material.

For the advisory material, for tire debris, harmonization is achieved by adopting the current AC 25.963-1 guidance on tire fragment spread angle and mass, but adopting the current ACJ 25.963(g) guidance of tire fragment speed.

For the advisory material, for engine debris, harmonization is achieved by adopting an additional definition of engine debris to be used in the absence of relevant data.

For the advisory material, for fire resistance, harmonization is achieved by adopting revised acceptable means of compliance to resistance to fire.

6. What should the harmonized standard be?

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

Docket No. ; Notice No.]

RIN 2120–

[Title] Fuel Tank Access Covers

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This notice proposes to amend the fire resistance requirements of §25.963(e)(2) to provide an equal level of safety for the fuel tank structure and the fuel tank access covers. The current requirement specifies that fuel tank access covers must be fire resistant as defined in part 1. The amendment would include an option permitting fuel tank access covers to have a level of fire resistance equivalent to the surrounding tank structure.

DATES: Comments must be received on or before

ADDRESSES:
Comments on this document should be mailed or delivered, in duplicate, to: U.S. Department of Transportation Dockets, Docket No. [ ], 400 Seventh Street SW., Room Plaza 401, Washington, DC 20590. Comments also may be sent electronically to the following Internet address: 9-NPRM-CMTS@faa.gov. Comments may be filed and examined in Room Plaza 401 between 10 a.m. and 5 p.m. weekdays, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: William M. Perrella, Federal Aviation Administration. 1605 Lind Ave SW, Renton, Washington, 98056; telephone 425 227-2116; facsimile 425-227-1100.

SUPPLEMENTARY INFORMATION:

Background: The current 14 CFR part 25 Airworthiness Standards of the Federal Aviation Regulations (FAR) requires that fuel tank access covers must be fire resistant as defined in part 1. That requirement was adopted by amendment 25-69 after an FAA review of adverse service experience prompted by an accident in Manchester, England.

Discussion: Section 25.963(e)(2) states that fuel tank access covers must be fire resistant as defined in part 1. The equivalent JAA requirement does not have any standard for fire resistance. In the interest of harmonization, the GSHWG has recommended that JAR 25 should be revised to include a requirement for fire resistant fuel tank access covers. The definition of the term 'fire resistant' differs between the FAR and JAR. The JAA recently revised the definition in JAR 1 to indicate that fire resistant materials are those which can withstand the ISO.....flame applied for 5 minutes. The FAA definition in part 1, which has been in existence for many years, refers to equivalency to aluminum in the dimensions appropriate for the application. The FAA has no intention to make the existing FAA requirement more stringent, however, the different definitions between JAA and FAA would result in different compliance standards. The working group therefore established new criteria which would provide an acceptable level of safety. Section 25.963(e)(2) would be revised to eliminate the term 'fire resistant as defined in part 1', and to provide several options for showing a minimum level for resistance to fire. Compliance could be shown if one of the following options could be met: (a) The tank access covers are made of aluminum, titanium, or steel, or (b) the tank covers can withstand the test of AC 20-135, or ISO 2685-1992(E) for a period of 5 minutes without failure, or (c) the tank covers can withstand the test of AC 20-135, or ISO 2685-1992(E) for a period of time at least as great as that of the immediately surrounding structure (such as the wing skins for wing fuel tanks).

This revision would permit fuel tank access covers to have the same level of fire resistance as the surrounding tank structure, thereby providing an equal level of safety for the entire fuel tank relative to fire resistance.

After the working group reached agreement on the above criteria, they coordinated with the JAA PPSG. The PPSG could not accept adding the proposed requirement to the JAA rule, since they believe there is no fire resistance requirement for the basic fuel tank structure. Therefore JAA never reached final technical agreement on this proposal. FAA is taking this action unilaterally, without concurrence by the JAA.

Comments Invited

Interested persons are invited to participate in the making of the proposed action by submitting such written data, views, or arguments as they may desire. Comments relating to the environmental, energy, federalism, or economic impact that might result from adopting the proposals in this document also are invited. Substantive comments should be accompanied by cost estimates. Comments must identify the regulatory docket or notice number and be submitted in duplicate to the DOT Rules Docket address specified above.

All comments received, as well as a report summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking, will be filed in the docket. The docket is available for public inspection before and after the comment closing date.

All comments received on or before the closing date will be considered by the Administrator before taking action on this proposed

rulemaking. Comments filed late will be considered as far as possible without incurring expense or delay. The proposals in this document may be changed in light of the comments received.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this document must include a pre-addressed, stamped postcard with those comments on which the following statement is made: "Comments to Docket No. ." The postcard will be date stamped and mailed to the commenter.

Availability of NPRMs

An electronic copy of this document may be downloaded using a modem and suitable communications software from the FAA regulations section of the FedWorld electronic bulletin board service (telephone: (703) 321-3339), the Government Printing Office (GPO)'s electronic bulletin board service (telephone: (202) 512-1661), or, if applicable, the FAA's Aviation Rulemaking Advisory Committee bulletin board service (telephone: (800) 322-2722 or (202) 267-5948).

Internet users may reach the FAA's web page at http://www.faa.gov/avr/arm/nprm/nprm.htm or the GPO's web page at http://www.access.gpo.gov/nara access to recently published rulemaking documents.

Any person may obtain a copy of this document by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue SW., Washington, DC 20591, or by calling

(202) 267-9680. Communications must identify the notice number or docket number of this NPRM.

Persons interested in being placed on the mailing list for future rulemaking documents should request from the above office a copy of Advisory Circular No. 11–2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedure

Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA has determined that there are no requirements for information collection associated with this proposed rule.

Compatibility With ICAO Standards

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and has identified no differences with these proposed regulations.

Regulatory Evaluation Summary

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic

effect of regulatory changes on small entities. Third, OMB directs agencies to assess the effect of regulatory changes on international trade. In conducting these analyses, the FAA has determined this proposed rule is not "a significant regulatory action" under section 3(f) of Executive Order 12866 and, therefore, is not subject to review by the Office of Management and Budget. This proposed rule is not considered significant under the regulatory policies and procedures of the Department of Transportation (44 FR 11034, February 26, 1979). This proposed rule would not have a significant impact on a substantial number of small entities and would not constitute a barrier to international trade. The FAA invites the public to provide comments and supporting data on the assumptions made in this evaluation. All comments received will be considered in the final regulatory evaluation.

[*Insert summary of the economic evaluation prepared by APO.*]

Initial Regulatory Flexibility Determination

The Regulatory Flexibility Act (RFA) of 1980, 5 U.S.C. 601–612, was enacted by U.S. Congress to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulations. The RFA requires a regulatory flexibility analysis if a proposed rule has a significant economic impact on a substantial number of small business entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, establishes threshold costs and small entity size standards for complying with RFA requirements.

[*Insert summary of the regulatory flexibility finding prepared by APO.*]

International Trade Impact Statement

The provisions of this proposed rule would have little or no impact on trade for U.S. firms doing business in foreign countries and foreign firms doing business in the United States.

Federalism Implications

The regulations proposed herein would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposal would not have sufficient federalism implications to warrant the preparation of a federalism assessment.

Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), codified in 2 U.S.C. 1501—1571, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is any provision in a Federal

agency regulation that would impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This proposed rule does not contain a Federal intergovernmental or private sector mandate that exceeds $100 million in any one year.

Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment or environmental impact statement. In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), regulations, standards, and exemptions (excluding those, which if implemented may cause a significant impact on the human environment) qualify for a categorical exclusion. The FAA proposes that this rule qualifies for a categorical exclusion because no significant impacts to the environment are expected to result from its finalization or implementation.

Energy Impact *The OPI is responsible for assessing the energy impact of a proposed rule. State whether the energy impact of the proposed rule has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) and Public Law 94–163, as amended (42 U.S.C. 6362). Also state whether it has been determined that it is not a major regulatory action under the provisions of the EPCA. AEE currently is drafting standard language for this statement.*

List of Subjects in 14 CFR Part 25

List of Subjects *List the parts in numerical order.*

14 CFR Part 25

Insert appropriate index terms.

14 CFR Part 25

Insert appropriate index terms.

The Proposed Amendment

In consideration of the foregoing, the Federal Aviation Administration proposes to amend part 25 of Title 14, Code of Federal Regulations as follows:

PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

1. The authority citation for part 25 to read as follows:

Authority: 49 U.S.C.[]

2. Amend §25.963(e)(2) to read as follows:

"(2) All covers must have the capacity to withstand the heat associated with fire at least as well as an access cover made from aluminum alloy in dimensions appropriate for the purpose for which they are to be used, except that the access covers need not be more resistant to fire than an access cover made from the base fuel tank structural material."

Issued in Washington, DC, on

7. How does the proposed standard address the underlying safety issue (identified under #1)?

The proposed rule and advisory material both address impact on fuel tank access covers by tire fragments, engine debris, or other likely debris, and also addresses the resistance to fire of fuel tank access covers.

8. Relative to the current FAR, does the proposed standard increase, decrease or maintain the same level of safety? Explain.

For impact on fuel tank access covers by tire fragments, engine debris, or other likely debris, the proposed rule and advisory material will maintain the tire fragment mass but increases the spread angle and fragment speed to be considered, compared to the current FAR standard. These adjustment were made based on a rational review of in-service data. The net result is to increase the energy level specified for current FAR standards. These energy levels have been reviewed by the authorities and found to be acceptable as to level of safety.

9. Relative to current industry practice, does the proposed standard increase, decrease or maintain the level of safety? Explain.

Most recent new certification programs have been certified using an envelope case involving both FAR/JAR standards for impact resistance. Compared to these envelope standards the level of energy associated with tire fragments would decrease upon adoption of the new proposed standards. This reduction in energy level is considered acceptable since it is based on the use of rational analysis of in-service data.

For resistance to fire, the proposals will maintain the level of safety intended by the current FAR standard. Compared to the current JAR standard, the level of safety will be increased.

10. What other options have been considered and why were they not selected?

Adoption of the current guidance contained in ACJ 25.963(g) on tire fragments size has been considered, but could not be supported by in service data.

Rejection of the requirement for fuel tank access covers to be fire resistant has also been considered, because the basic wing structure is not required to be fire resistant either. For the sake of harmonization the JAA has accepted the proposed wording.

11. Who would be affected by the proposed change?

Airplane manufacturers.

12. To ensure harmonization, what current advisory material (e.g. ACJ, AMJ, AC, policy letters) need to be included in the rule text or preamble?

The current AC 25.963-1 allows that the fuel tank access covers need not be more resistant to fire than an access cover made from the base fuel tank structural material. This has been transferred to the proposed rule.

13. Is existing FAA advisory material adequate? If no, what advisory material should be adopted?

The existing FAA advisory material is adequate to address the underlying safety concerns, but harmonization can only be achieved by adoption of the proposals described below.

The following revised guidance material is recommended:

Draft
Fuel Tank Access Doors
AC 25.963-1
May 19, 1999

1. PURPOSE. This advisory circular (AC) sets forth a means of compliance with the provisions of Part 25 of the Federal Aviation Regulations (FAR) dealing with the certification requirements for fuel tank access covers on turbine powered transport category airplanes. Guidance information is provided for showing compliance with the impact and fire resistance requirements of 25.963(e).

2. RELATED FAR SECTIONS. The contents of this AC are considered by the FAA in determining compliance of the fuel tank access covers with 25.963(e). Section 121.316 also requires each turbine-powered transport category airplane operated in air carrier or commercial service after October 30, 1991, to meet the standards of 25.963(e).

3. BACKGROUND. Fuel tank access covers have failed in service due to impact with high speed objects such as failed tire tread material and engine debris following engine failures. Failure of an access cover on a fuel tank may result in loss of hazardous quantities of fuel which could subsequently ignite.

4. IMPACT RESISTANCE.

a) All fuel tanks access covers must be designed to minimise penetration and deformation by tire fragments, low energy engine debris, or other likely debris, unless the covers are located in an area where service experience or analysis indicates a strike is not likely. The rule does not specify rigid standards for impact resistance because of the wide range of likely debris which could impact the covers. The applicant should, however, choose to "minimise penetration and deformation" by analysis or test of covers using debris of a type, size, trajectory and velocity that represents conditions anticipated in actual service for airplane model involved. There should be no hazardous quantity of fuel leakage after impact. It may not be practical or even necessary to provide access covers with properties which are identical to those of the adjacent skin panels since the panels usually vary in thickness from station to station and may, at certain stations, have impact resistance in excess of that needed for any likely impact. The access covers, however, need not be more impact resistant than the average thickness of the adjacent tank structure at the same location, had it been designed without access covers. In the case of resistance to tire debris, this comparison should be shown by tests or analysis supported by test.

b) In the absence of a more rational method, the following may be used for evaluating access covers for impact resistance to tire and engine debris.

i) Tire Debris - Covers located within 30 degrees inboard and outboard of the tire plane of rotation, measured from center of tire rotation with the gear in the down and locked position and the oleo strut in the nominal position, should be evaluated. The evaluation should be based on the results of impact tests using tire tread segments equal to 1 percent of the tire mass distributed over an impact area equal to 1½ percent of the total tread area. The velocities used in the assessment should be based on the highest speed that the aircraft is likely to use on the ground under normal operation.

ii) Engine Debris - Covers located within 15 degrees forward of the front engine compressor or fan plane measured from the center of rotation to 15 degrees aft of the rearmost engine turbine plane measured from the center of rotation, should be evaluated for impact from small fragments. The evaluation should be made with energies referred to in AC 20-128A, Design Considerations for Minimizing Hazards Caused by Uncontained Turbine Engine and Auxiliary Power Unit Rotor and Fan Blade Failure. The covers need not be designed to withstand impact from high energy engine fragments such as engine rotor segments or propeller fragments. In the absence of relevant data, an energy level corresponding to the impact of a 3/8 inch cube steel debris at 700fps, 90 degrees to the impacted surface or area should be used.
(For clarification, engines as used in this advisory material is intended to include engines used for thrust and engines used for auxiliary power, APU.)

5. RESISTANCE TO FIRE. Fuel tank access covers meet the requirements of 25.963(e)(2) if they are fabricated from solid aluminium or titanium alloys, or steel. They also meet the above requirement if one of the following criteria is met.

a) The covers can withstand the test of AC 20-135, Powerplant Installation and Propulsion System Component Fire Protection Test Methods, Standards, and Criteria, issued 2/9/90, or ISO 2685-1992(E), Aircraft - Environment conditions and test procedures for airborne equipment - Resistance to fire in designated fire zones, for a period of time at least as great as an equivalent aluminium alloy in dimensions appropriate for the purpose for which they are used.

b) The covers can withstand the test of AC 20-135, Powerplant Installation and Propulsion System Component Fire Protection Test Methods, Standards, and Criteria, issued 2/9/90, or ISO 2685-1992(E), Aircraft - Environment conditions and test procedures for airborne equipment - Resistance to fire in designated fire zones, for a

period of time at least as great as the minimum thickness of the surrounding wing structure.

c) The covers can withstand the test of AC 20-135, Powerplant Installation and Propulsion System Component Fire Protection Test Methods, Standards, and Criteria, issued 2/9/90, or-ISO 2685-1992(E), Aircraft - Environment conditions and test procedures for airborne equipment - Resistance to fire in designated fire zones, for a period of 5 minutes. The test cover should be installed in a test fixture representative of actual installation in the airplane. Credit may be allowed for fuel as a heat sink if covers will be protected by fuel during all likely conditions. The maximum amount of fuel that should be allowed during this test is the amount associated with reserve fuel. Also, the static fuel pressure head should be accounted for during the burn test. There should be no burn-through or distortion that would lead to fuel leakage at the end of the tests; although damage to the cover and seal is permissible.

14. How does the proposed standard compare to the current ICAO standard?

The current ICAO standards do not address this issue.

15. Does the proposed standard effect other HWG's?

Yes, the PPIHWG, on the issue of resistance to fire. The PPIHWG has reviewed and accepted the GSHWG proposal.

16. What is the cost impact of complying with the proposed standard?

Comparing the proposal with the current FAR rule and advisory material, no increase or decrease in cost is expected.

17. Does the HWG want to review the draft NPRM at "Phase 4" prior to publication in the Federal Register?

Yes.

18. In light of information provided in this report, does the HWG consider that the "Fats Track" process is appropriate for this rulemaking project, or is the project too complex or controversial for the "Fast Track" process. Explain.

The GSHWG considers the Fast Track process to be appropriate for this project.

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